

## PATENT COOPERATION TREATY

## PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

REC'D 04 JAN 2005

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| Applicant's or agent's file reference<br>533-PCT   | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) |  |
| International application No.<br>PCT/CA 03/01415   | International filing date (day/month/year)<br>16.09.2003   | Priority date (day/month/year)<br>27.09.2002 |
| International Patent Classification (IPC) or both national classification and IPC<br>D21H23/76 |  |  |
| Applicant<br>E.Q.U.I.P. INTERNATIONAL INC.   |  |  |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.
  - ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

## 3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

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|---|---|
| Date of submission of the demand<br><br>02.04.2004  | Date of completion of this report<br><br>29.12.2004   |
| Name and mailing address of the International preliminary examining authority:<br><br> European Patent Office<br>D-80298 Munich<br>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br>Fax: +49 89 2399 - 4465 | Authorized Officer<br><br>Nestby, K<br><br>Telephone No. +49 89 2399-8625  |

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/CA 03/01415**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

**Description, Pages**

1-16 as originally filed

**Claims, Numbers**

1-11 filed with telefax on 08.10.2004

**Drawings, Sheets**

1/2, 2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
  - ☐ the language of publication of the international application (under Rule 48.3(b)).
  - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:
- ☐ contained in the international application in written form.
  - ☐ filed together with the international application in computer readable form.
  - ☐ furnished subsequently to this Authority in written form.
  - ☐ furnished subsequently to this Authority in computer readable form.
  - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
  - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.
4. The amendments have resulted in the cancellation of:
- ☐ the description, pages:
  - ☐ the claims, Nos.:
  - ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/CA 03/01415

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims | 1-11 |
|                               | No: Claims  |      |
| Inventive step (IS)           | Yes: Claims | 1-11 |
|                               | No: Claims  |      |
| Industrial applicability (IA) | Yes: Claims | 1-11 |
|                               | No: Claims  |      |

2. Citations and explanations

**see separate sheet**

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Methods of increasing retention rate and/or drainage in a papermaking furnish comprising adding to the furnish a phenolic resin and polyethylene oxide are described in the following documents:

D1 : US-A-4 070 236 (cited in the description of the present application)

D2 : US-A-5 472 570 (

D3 : US-A-5 755 930

D4 : US-A-5 516 405

Moreover, according to all of D1 to D4 an additional retention aid which is a cationic polymer is also added to the stock.

The subject-matter of claims 1 and 5 differs from said prior art in that the cationic polymer retention aid (before adding to the furnish) is a flocculating aqueous, solventless liquid dispersion without any oil-phase, having viscosities in water at 1 % of between 2,000 and 20,000 mPa sec.

The subject-matter of claims 1, 5 is therefore novel (Article 33(2) PCT).

- 1.1 Said cationic polymer retention aid has the liquid properties of a coagulant (known as having low molecular weights normally less than 1,000 mPa sec), but acts as a flocculant. Therefore, the same effect can be achieved with lower dosages. In this regard, it is different from all other retention aids mentioned in the cited prior art.

The synthesis of such polymeric dispersions is described in US-A-5 480 934 (D5). Although their use as retention agent in paper production is mentioned in D5, no suggestion is made that they could be used as a component of the phenolic resin/PEO system.

The subject-matter of claims 1, 5 is hence considered as involving an inventive step (Article 33(3) PCT).

- 1.2 Claims 2-4, 6-11 are dependent on claim 1, respectively claim 5 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

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ART 34 A/2005

### CLAIMS

1. A papermaking furnish comprising a combination of a solventless cationic polymer retention aid with phenolic resin and polyethylene oxide as a retention  
5 system for retaining fines, fillers and other papermaking chemicals in the paper sheet.
2. A papermaking furnish according to claim 1, in which the solventless cationic polymer retention aid is a liquid, aqueous, solventless dispersion of a cationic polymer, without any oil-phase.
3. A papermaking furnish according to claim 2, in which said suspension has a  
10 charge density of between 20 and 75 mole %, a solids content of between 2 and 70 wt% and viscosities in water at 1% of between 2000 and 20,000 mPa sec.
4. A papermaking furnish according to claims 1, 2 or 3, in which the amount of the solventless cationic retention aid is 0.05 kg/ton to 10 kg/ton based on the weight of dry fibers; the amount of phenolic resin is 0.05 kg/ton to 10 kg/ton of actual resin  
15 in as supplied material per ton of dry fibers; and the amount of polyethylene oxide is 5 g/ton to 500 g/ton based on the weight of dry fibers.
5. A papermaking furnish according to any one of claims 1 to 4, in which the ratio of the solventless cationic retention aid to the phenolic resin is from 200:1 to 1:200; the ratio of the phenolic resin to polyethylene oxide is from 100:1 to 1:100 and  
20 the ratio of the solventless cationic polymer retention aid to polyethylene oxide is from 1:2000 to 2000:1.
6. A method of increasing retention rate and/or drainage in a papermaking furnish comprising adding to the furnish an effective amount of a solventless cationic

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ART 34 AMDT.

polymer retention aid in combination with phenolic resin and polyethylene oxide.

7. A method according to claim 6, in which the solventless cationic polymer retention aid is added to the furnish together with the phenolic resin at the same point of addition.

5 8. A method according to claim 6, in which the solventless cationic polymer retention aid is added to the furnish separately from the phenolic resin at a different point of addition.

9. A method according to claims 6, 7 or 8 in which the solventless cationic polymer retention aid and the phenolic resin are added to the furnish before or after  
10 the polyethylene oxide addition.

10. A method according to claim 8, in which the solventless cationic polymer retention aid is added last, after the phenolic resin and polyethylene addition and after the last point of shear.

11. A method according to claim 6, further comprising adding a filler to the  
15 furnish and pretreating said filler with the solventless cationic polymer retention aid.

12. A method as claimed in claim 11, in which the pretreated filler is dosed into the furnish before the last point of shear and before addition of the polyethylene oxide.